

BULLETIN NO. 40

GOVERNMENT OF THE PROVINCE OF SASKATCHEWAN
DEPARTMENT OF AGRICULTURE
LIVE STOCK BRANCH

THE CARE, HANDLING AND MARKETING OF WOOL

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PUBLISHED BY DIRECTION OF THE HON. W. R. MOTHERWELL,
MINISTER OF AGRICULTURE



REGINA:
J. W. REID, Government Printer
1914



THE CARE, HANDLING AND MARKETING OF WOOL

THE IMPORTANT PLACE OF WOOL IN THE SHEEP INDUSTRY.

The sheep industry in Western Canada has of late years suffered a serious decline and one of the reasons for its lack of popularity has been the low average price received for wool. For this, to a very large extent, the sheepman has had himself to blame, for if there is one thing that has been mishandled and improperly treated by the majority of sheepmen and one thing in the marketing of which men have not kept pace with advancing economic principles, that one thing is the wool crop. In November, 1911, the report of the Canadian Commission on the sheep industry was published and all through this valuable publication we find emphasised the fact that the sheepmen of North America in general, and Canada in particular, have suffered incalculable losses annually through their methods of caring for, preparing and marketing their wool.

When the increased returns of the wool crop to the sheepman, if properly cared for, the possibilities underlying its proper handling from the sheep's back to the mill, and the widened market which has been opened to Canadian wool by the abolition of the United States tariff on that commodity, are all taken into consideration, the true value of the Canadian wool crop to Canada and Canadian sheepmen is apparent.

Does it ever occur to the average farmer or rancher who keeps sheep to figure out the proportionate value of the wool crop compared with the returns from other sheep products. A few have possibly done it, but not many. Some years ago, and even yet in certain sections, the wool crop was the product as far as sheep were concerned, because at that time Western Canada was not so thickly populated with human beings and had a larger actual sheep population. The result was that the supply of mutton greatly exceeded the demand and consequently the price was so low as to hardly make it worth raising. On this account sheepmen, both in Canada and the United States, turned their attention to wool production. With the increase in population and the world scarcity of meat producing animals, however, the situation has greatly changed, so much so that beginners in the keeping of sheep, and possibly some of the older shepherds also, more especially on the farms, have come to look upon wool as rather more of a by-product of the sheep industry than as having an equal if not greater value than any other product, which is in reality the case. To prove the truth of this latter statement let us look at the value of the wool as compared with the lamb crop.

WOOL VERSUS LAMBS.

Taking an average fleece in Western Canada at seven pounds and the average value at 15c per grease pound, both of which would seem a conservative estimate, we have an annual gross wool value per sheep of \$1.05. Now the sheep have both to be dipped and shorn in order to keep healthy and produce healthy lambs, but they also have to be fed and cared for to produce wool, which evens up the estimate. Then if we charge dipping and shearing of ewes against the wool, and care and feed

of lambs against the lamb crop, it would seem to be an equitable arrangement. Shearing : 8c per head leaves a balance of 97c, and dipping, twine and sacks at 6c, leaves 91c per head per annum as a conservative estimate of the net value of the wool per sheep. That is to say that a man with 100 sheep would have \$91 clear as his profit on wool.

Then let us take the lamb side of the question. Suppose we allow 125 lambs to the 100 ewes, which is a high average for Western Canada, taking ranch and farm alike. The weight of a lamb at birth has been found to be from six to twelve pounds. Placing the average at nine pounds and allowing a gain of one-third of a pound per day during the period from birth to block, which is generally four months, we have sheep at that age weighing fifty pounds. These at 6c per pound, live weight, fetch a gross income of \$3, against which we must place the cost of feed and care for that time. Feed on the average will cost the sheepman who wishes to produce 50 pound lambs in four months, about \$1.50, to which should be added another 50c for care, when we have a net profit of \$93.75 as compared with \$91 for wool from the same number of ewes, or almost an equal net income from both sources.

Taking these facts into consideration there seems no reason why the wool crop should not receive greater attention than it does. Sheepmen take many precautions to insure and conserve a full and healthy lamb crop, but few, if any, to insure and properly prepare a high quality wool crop. It should be given a fair trial at least, to see if the extra care and attention are not well repaid.

WHAT DETERMINES VALUE IN WOOL.

Before going into the means whereby the improvement of the wool crop can be effected let us study briefly the bases upon which wool is valued. The three cardinal points to consider in any fleece are *quantity*, *quality* and *condition*. Quantity is determined by *length* and *density*. Quality is determined by *fineness* and *lustre*. Condition by *soundness*, *purity* and *yolk*.

QUANTITY AS INFLUENCED BY LENGTH AND DENSITY.

Some explanation of these terms may be necessary. Commencing with *quantity*, we have length and density: The term *length* needs no definition, but length is an important feature both commercially and from the shepherd's standpoint. Wools are generally known as long stapled or "combing" wools, which are used for worsted cloth, and short stapled or "carding" wools which are used for woollen cloth, and known as "clothing" wools. Long stapled wools include those of the Lincoln, Leicester, Cotswold, Romney Marsh and Blackfaced or Highland breeds of sheep. Short stapled include those of all the Down breeds and the Cheviot and Welsh sheep. The importance of knowing whether wool will grade as "combing" or "clothing" will be realised when it is considered that "combing" wool is usually worth from two to three cents per grease pound more than "clothing" wool.*

Density may be described as being the closeness of the wool fibres or the number of fibres per square inch. The greater the number of fibres per inch the denser the fleece and *vice versa*. Pure bred Merinos have from 40,000 to 48,000 fibres on a single square inch. The coarsest woolled breeds have from 5,000 to 6,000. Density is not only valuable

*NOTE.—To be graded as combing wool, the fibres of a fleece should, for an average grade, be two and one-half inches long without stretching.

on account of increasing the weight of the fleece, but also on account of the protection it affords the animal and the fact that the denser the fleece the less opportunity there is for chaff and dirt to obtain lodgement. In short, density is valuable as it makes for (1) heavy fleece, (2) protection, (3) cleanliness, (4) uniform strength of wool fibre.

QUALITY AS DETERMINED BY FINENESS AND LUSTRE.

Fineness.—Generally speaking, fineness is found to be in proportion to density, but we may have varying fineness in dense fleeces. For instance, we have in the same fleece a difference in the fineness on different portions of the body. When the fleece is opened on the shoulder we have a finer, denser fleece than is found on the thigh of the same animal. In fineness is included not only the closeness and quality of the different fibres as a whole, but also the crimp or fold running along the various individual fibres. Fineness is also proportionate to the closeness and number of these folds. In coarse woolled sheep they are few and gradual; in fine woolled animals they are many and close and may twist back and forth almost at right angles to one another.

Lustre.—Lustre in wool is the pearly gloss or brilliance which betokens quality and cleanliness. There is little or no lustre in the wool on an underfed or sickly sheep. Brilliant lustre is a sign of health.

CONDITION AS REVEALED BY SOUNDNESS, PURITY AND YOLK.

Soundness.—Soundness in wool means equal strength throughout the length of each individual fibre. Wool from a sheep that has been sick or is unsound from any other cause can be seen to have a less close crimp in the part of the fibre that is weak. In stretching locks of such unsound wool, it will be found that they always break at the same place.

Purity.—As the word implies, purity refers to freedom from all foreign material no matter of what origin, whether chaff from feed, paint used as a brand, fragments of twine or sacks, or stable dirt which clots the locks. All these are injurious and lessen the value of the fleece.

Yolk.—Also known as "suint" or "body" is in reality the amount of oily natural secretion in the wool. The heavier the yolk the richer the colour and the oilier the fleece. Abundant oil or yolk is an indication of health and gives added weight but no greater actual value. Yolk at its secretion is liquid and in some breeds of sheep remains in this state moistening and softening the fleece; in other breeds, particularly some families of Merino, the yolk thickens or dries into a sort of gum or wax of an orange colour which adheres to the wool and greatly adds to its weight.

IMPROVEMENT OF WOOL BY BREEDING.

Uniformity of fleece is essential in wool production. In order to produce uniformity in fleece, as in any other animal characteristic, it is necessary that the sheep raiser should pay careful attention to breeding. Mutton flocks can be bred up so as to yield a greatly improved quality of fleece without in the least impairing their value from the butcher's standpoint.

The continued use of pure bred rams of the same breed is advisable from every point of view and it is by following this practice that the sheepman will most quickly improve the quality of the wool crop. Although crosses for feeding purposes are often valuable, it is not as a general rule advisable to mate long-wool sires with short-wool ewes or *vice versa*.

In order to yield a uniform wool crop the ewes should be as nearly alike as possible as regards both breeding and fleece characteristics.

The majority of breeds represented in the West, both pure breeds and grades, produce a quality of wool which is in constant demand and this quality can be greatly improved by careful and judicious selection and mating. Rams which have coarse, hairy fleeces should never be used for breeding purposes, and the same applies to ewes.

CARE OF WOOL—ON THE SHEEP'S BACK.

The care of wool starts in the lamb practically with birth, and, in the older animal, the care of the next wool crop commences just after shearing. Referring to the bases upon which wool is valued we find that the care of wool whilst on the sheep's back influences all three factors of value, namely: quantity, quality and condition.

Starting either with the lamb or the newly shorn sheep the first step in the care of wool is dipping.

DIPPING.

This process has a great influence on the value of the wool crop. In the report of the Canadian Commissioners we find the following, which should be borne in mind by every sheepman.

"Apart from all its well known advantages to the sheep, its full value as a wool producer and fleece improver is not comprehended. Before Canada can compete with such countries as New Zealand and Britain in wool growing, *dipping must be done twice a year*. In the countries mentioned it is compulsory, but its value as a wool producer is so well recognised that growers could not be induced to cease dipping, even if the compulsory law were suspended. In addition to stimulating the growth of the wool, it imparts a "bloom" to the fleece which gladdens the eye of the keenly observant and appreciative buyer. He never forgets the bloom, nor the "lofty, springy handle" and looks for that clip again next year. As soon as it is offered, he is the first man to open his mouth and the last man to be silent. When these two countries, with their open winters and humid atmosphere, find it so valuable, how much more important must it be in Canada with its hard winters, and dry feeding, not to mention the usual dry atmosphere of summer and early fall."

Sheep should be dipped twice a year. The first time from two to three weeks after shearing when *the whole flock must go through the dipping vat* and again in the fall before the weather is cold enough to make the wet sheep suffer. Any of the standard dips are efficacious and, if necessary, dipping vats and other requisites may be obtained from any of the large firms handling commercial sheep dip.

SUMMER CARE.

From dipping we pass to summer care and it should be borne in mind that if the fleece is to be kept in good condition, so must the animal. Sheep which are exposed to hardship, are poorly fed, or suffer from sickness or irritation due to parasites or in fact from anything which seriously affects the general health, will not yield fleeces of good quality. External parasites also induce rubbing which tends to break and tangle the wool and thus reduces the value of the fleece.

When a sheep has been badly chilled or has become sick in any way so as to cause the pores of the skin to contract, a break or shrinkage occurs in the fibre at that point. The wool on a sheep grows from a small sac in the skin and each fibre passes through a small opening that may be easily contracted or expanded according to different influences. As it contracts the circumference of the fibre is reduced and we have a weak spot throughout the fleece at that point of growth and a fleece of reduced value. Thus a densely fleeced animal which is less liable to chill has a correspondingly greater chance of yielding a sound fleece.

Sheep should be kept in good breeding condition, at least, if a wool crop of uniformly high quality is to be procured.

BRANDING OR MARKING.

Another procedure which usually takes place after dipping is the branding or marking of the sheep with paint. In the West and on the larger ranches this is usually done by dipping a branding iron in the paint and placing it on the fleece.

The procedure is simple and seemingly harmless, but this is by no means the case, for upon this very process often depends the profit or loss on wool. Nearer use common paint to mark sheep with whether on ranch or farm. Ordinary paint will not scour out of wool and consequently the manufacturer has to go to the expense of having the paint-smeared locks clipped off by hand labour, which is an extremely costly process. Added to this the brand or mark is generally placed on the shoulder or ribs, the most valuable parts of the fleece, so that when the damaged locks are cut out or cut off, the fibre at that point is shortened and the value of the fleece is materially reduced. F. J. Hagenbarth, President of the United States National Wool Growers' Association, said recently in an address at the convention of that association at Salt Lake City:

"The average flock master seems to delight in covering his sheep from one end to another with unsightly blotches misnamed 'brands.' Does he realise that the branding of sheep with an insoluble material costs the western flock master an average of nearly two cents per pound on all the wool he grows. Yet this is a fact. Branding should never be done except where compulsory or absolutely necessary."

This is first hand testimony and every sheepman knows that every cent he loses on his wool brings him closer to the debit side of the ledger. The University of Wyoming Bulletin No. 93 contains a lot of good advice with regard to branding paints, and the figures from this bulletin are given herewith:

PAINT	Durability		
	On coarse wools	On medium wools	On fine wools
Common, Venetian red, linseed oil and turpentine	mos. 7	mos. 12	mos. 12
Devroe & Reynolds' "Special"	6	8	8
Oregon Wood Distilling Company's	5	8	8
Kemp's Australian	5	7	7
Sherwin-Williams' "Harmless"	4	6	6
Stockman's Supply House "Perfect"	4	6	5

SCOURING TEST.

PAINTS	Tests
Common	Does not scour
Devoe & Reynolds' "Special"	Does not scour
Oregon Wood Distilling Company's	Fair
Kemp's Australian	Scoured perfectly
Sherwin-Williams' "Harmless"	Does not scour
Sockman's Supply House "Perfect"	Fair

The tests were made as uniform as possible, the same sheep being branded with the different paints.

In their valuable series of advisory pamphlets to wool growers, the National Wool Warehouse and Storage Company, of Chicago, give the following figures which were sent to them by a well known manufacturing firm. The figures are preceded by an explanatory statement which is also given herewith.

"Now if the 'paint' nuisance can be met and overcome, it will remove the last objection to the use of these wools. We do not believe that growers generally realise the big handicap this big daub of paint on the most valuable part of the fleece is to the industry. We have got to the point now that we will not buy a large lot of any of these wools without first having ample sacks submitted for test. We carefully take off the paint locks and weigh them, and if the percentage is above normal we either reject the lot wholly or make an offer for the wool in proportion to its value as found by these tests. We find a wide difference in the amount of paint locks obtained from different lots. Here are some tests recently made:"

Lot No. 1—3 bags tested, 1 pound paint locks.
 Lot No. 2—3 bags tested, 13 pound paint locks.
 Lot No. 3—2 bags tested, 17 pound paint locks.
 Lot No. 4—3 bags tested, 7 pound paint locks.
 Lot No. 5—3 bags tested, 6 pound paint locks.
 Lot No. 6—3 bags tested, 20 pound paint locks.

This shows an enormous difference in the care of the different lots. Lot number 6 contained twenty pounds of paint-smearred wool and 20 times as much as lot number 1. Twenty pounds of wool to be hand clipped out of 150 fleeces, or roughly speaking one-sixtieth of the three bags in lot 6 spoiled by paint. No wonder manufacturers cut prices. If branding or marking must be done it should be done with the best and most easily scoured paint procurable, which should at the same time be as durable as possible.

CARE DURING FALL AND WINTER.

During fall and winter care should be taken to keep the fleeces of the flock as free as possible from chaff, chaffy straw, dirt, etc., from the feed. The racks in the sheep shed should be built upright, not overhanging the sheep's back, which latter form is most objectionable. If the flock has access to a straw pile the open side or sides should be kept straight up and down so that the sheep cannot walk under overhanging straw, and the fleece thus get filled up with chaff, etc. The shepherd should be as careful as possible in filling the racks or throwing down feed to see that it does

not light on the backs of the animals. For this reason it is usually advisable to shut the flock out of the sheep shed when filling troughs or racks. The sheep shed should be so arranged as to render it unnecessary to carry fodder through the flock, or to throw it down where dust or chaff may fall on the fleeces. Cockle burr, or burrs of any description, should be avoided. If in pasture mow down. If in feed do not use for sheep.

CLEANLINESS.

Sheep should be kept in as clean and dry quarters as possible and all sheep should be docked. Prior to winter they should be tagged or clipped out, the dirty clotted portions of the fleece around the exterior being cut away in this operation. Sheep will not do so well if kept on damp footing or with damp fleeces. The careful sheepman will see that there is abundance of bedding, clean floors, absence of draughts, but ample ventilation and a good roof over his charges, and will be amply repaid for his trouble. Laxative feeds, or feeds which produce scouring, such as frozen oat sheaves, millet, etc., are also undesirable from the point of view of clean fleeces. Ewes at lambing time should be taken especial care of, and a dry, well bedded place or, if outside, a high, dry knoll should be selected for a lambing pen. Sheep must be kept in good, healthy condition with plenty of wholesome food and pure water throughout the year if they are to produce a maximum quantity of sound wool.

SHEARING.

To a certain extent the value of the wool crop depends upon the time of shearing. As a general rule shearing in Western Canada does not take place before the twentieth of May and usually it is advisable to shear later than this, especially if the shearing machine is used. Sudden changes of weather, etc., may cause the loss of valuable animals if they are shorn too early, and also sheep that are shorn too early do not generally carry as much yolk and thus yield lighter fleeces. As most wool in the West is bought by the grease pound the advantage is obvious. On the other hand sheep will not do so well if fleeces are left on after warm weather sets in and they should not be left until the wool starts to come off in rolls as sometimes is the case.

There are two different appliances used for shearing, the old hand shears and the hand turned or power clipping machine, the latter of which is fast coming into favour.

SHEARING CLEAN.

Shearing is one of the most important factors in the quality of the wool crop. Sheep should always be shorn dry, on a clean floor or platform, and, if inside, in a shed or building with abundance of light. A raised platform ten feet square with a smooth surface is generally large enough for the work. This should be kept as clean as possible throughout shearing. If a platform is not available a large clean sheet may be utilised for this purpose. The actual shearing itself is an important operation which is being greatly simplified by the use of the shearing machine. In order to obtain the maximum value for any fleece the fibres should be as uniform in length as possible. When a sheep is poorly shorn it not only leaves the animal rough and unsightly, covered with steps and stairs, but it also

leaves the fleece the same way, with fibres of different lengths. Second cuts which are made by shearing close to the body at one portion of the blade and too far away at another in the same stroke, caused by not following the shape of the body and thus requiring a second cut to level off, are also detrimental for the same reason. The wool should be cut off smoothly close to the body, which requires some skill with the shears, but is relatively easy with the machine.

The fleece must also be left as intact as possible, and to do this it is necessary to hold the sheep so that it will not kick or struggle, and, in turning during shearing, to always turn the animal the one way, thus keeping the fleece from getting mixed up and torn by the feet of the sheep. The methods of shearing are outlined in Bulletin No. 37 issued by the Department of Agriculture. Sheep should not be shorn when the wool is damp or wet as it does not store well. The moisture may cause it to mould or so affect it as to greatly reduce the value of the fleece on account of weakened fibres and decreased quality.

ROLLING AND TYING THE FLEECE.

As in shearing, the fleece should be kept as clean as possible during this operation, and to do this it must be rolled on a clean place. Before starting to roll all tags or "britches" consisting of locks of wool clotted with manure or dirt should be clipped off and thrown into a basket or canvas, to be packed separately. If left on, these tags not only stain the wool but also, containing moisture as they do, may cause it to mould in storage.

It is a common sight to see fleeces rolled on the dirty floor of the shearing shed. The advice given in the Canadian Commission's report should not be overlooked. It is as follows:

"Rolling up the fleece on the floor is a dirty and wasteful habit in every way. The fleece should be picked up by the 'tier' and rolled on a table constructed for the purpose. This table may be any convenient size and the usual height. The top should not be solid but should consist of narrow laths under two inches wide and fixed half an inch apart. The laths should be smooth hardwood and slightly rounded at the top. This kind of table not only allows the loose bits, second cuts, and sand to fall through and drop on the floor, but also enables the 'tier' to roll up a tidy fleece and securely tie it without having to endure all the weariness and backache he does at present. He can also do his work so much more quickly that he can keep several extra shearers going, and find his work a pleasure compared with what it is at present. Fewer 'tiers' would be necessary in this way and another saving effected." Whilst tables of this kind are not always obtainable the fact remains that fleeces must be rolled on a clean surface if they are to present a neat and cleanly appearance.

The fleece should always be rolled with the cut or fresh side out. It should be spread on a clean spot on the floor or, better still, on the lath-topped table, as above mentioned. The sides are first folded in, care being taken that no broken or loose ends stick out, the fleece rolled from the neck to the rear, and firmly tied with hard, smooth twine, not larger than one-eighth of an inch in diameter, which should be wrapped around at least once each way and tied securely. If the knot slips the fleece becomes unrolled and is so torn and tangled in packing and shipping as to greatly reduce its value. Probably

one of the greatest sources of loss in the handling of wool in this province is due to the class of twine which is used to tie the fleeces. In many cases binder twine is used, whilst the use of a soft, easily unravelled wool twine is quite common. Few, if any, shepherds use the proper kind of twine and paper twine is almost unknown. When rough, easily unravelled twine is used, fibres of sisal or hemp become detached during packing and in transit and become mixed with the wool from which they cannot be separated. The most careful manipulation of the manufacturer often fails to detect these fibres which, being composed of vegetable matter, will not take wool dye and do not appear until the cloth is dyed. This makes it impossible to use wool tied with such twine except for cheap goods in which the uncoloured fibres are not so objectionable. The consequence is that buyers pay from two to five cents per pound less for wool tied with poor twine. In Britain the majority of fleeces are tied within themselves, a portion of the fleece being so manipulated as to form a serviceable and strong medium for holding the fleece together. One United States manufacturer in a letter to the National Wool Warehouse Company, at Chicago, writes as follows:

"Sisal twine has given our mills so much trouble that we will not use wool with fleeces so tied at any price. We have rejected good lots of wool when only the sacks had the ends sewn with sisal twine."

A gain, to quote from a pamphlet issued by the National Wool Warehouse:

"Strings of jute, hemp or sisal, when withdrawn from the fleeces, leave particles in the wool. These may be too small for detection until the goods are ready for the dye. As wool is an animal fibre, and hemp, jute and sisal vegetable fibres, the dye required for the wool will not similarly affect the other fibres."

Paper twine may be obtained from two different firms and their agents, the addresses of which will be furnished upon application to the Department of Agriculture. That most commonly recommended is what is known as size four and a half and is a three or four ply paper twine. Good paper twine is strong, durable and cleanly and meets with the approval of both commission agent and manufacturer. It can be obtained at a relatively small cost and laid down in Saskatchewan at about 25 cents for forty strings or enough to tie forty fleeces; 25 cents to tie 280 pounds of wool, or less than one-tenth of a cent per fleece. If it is not possible to get paper twine, a smooth glazed twine should be used with which there is a slight risk of fibre detachment. In selecting a paper twine it is advisable to get one as soft and pliable as possible, otherwise there may be trouble with fleeces becoming untied. See that the fleece is tied with a square knot, not a "grannie." Fleeces should be tied separately; where two are tied with the same string they cause extra work in grading as they then have to be separated from one another.

PACKING THE FLEECES.

The packing of the wool crop has also a great deal to do with the price received and the profit made. Fleeces should be graded when first packed. Grading does not require any special knowledge or expert attention. The terms "grading" and "sorting" are often confused. Grading consists in placing the entire fleece with other fleeces of similar condition and quality. Sorting is the separation according to quality

of an individual fleece. A single fleece can only be of one grade but may yield many "sorts." Sorting is done by the manufacturer but grading should be done by the seller of the wool. It is not necessary to go into a technical discussion of the various grades, but the following from Craig's book on "Sheep Farming" may be of interest here.

"Grades of wool:

Finest or XX—Full blood (not necessarily pure blood).

Fine or X—Three-quarter blood.

Next grade—Half blood.

Next grade—Three-eighths blood.

Next grade—One-quarter blood.

Fine Merino wool is usually the standard for quality by which other grades are measured. Practically all fleeces from the various styles of Merino will fall into grades higher than half blood. Most Southdowns will run around three-eighths blood and usually clothing. Some Shropshire fleeces may grade three-eighths and may be either clothing or combing. Few Oxfords will grade higher than one-quarter blood and the best Cotswolds and Lincolns would be classed as quarter bloods and the coarsest as braid or coarse combing. The coarser wool shrinks the least and quoted on a grease basis looks higher than the finer grades, but this difference disappears when values on the scoured basis are studied."

When packing, if possible to do so, the fleeces of ewes, lambs, rams and wethers are better packed separately, but in any event the fleeces from rams or "bucks" as they are known, and black, brown or gray fleeces must not be packed with other wool. When, as in small flocks, it is not practicable to pack the different grades in separate sacks, they may be packed in the same sack and can be separated by sheets of strong stiff paper, so that they can be easily sorted at the market. Wools from different breeds, or graded-up animals of different breeds, should be kept separate, especially if the breeds are long and short woolled. A sack containing different kinds of wool should be clearly marked so that the contents may be known and there will be no suspicion of attempt to defraud, besides easier work in grading. Tags or pulled wool (wool from dead sheep) must be packed separately, as the tags generally contain moisture which renders the wool liable to mould. Wools packed damp turn yellow quickly and in many cases there is pronounced damage to the fibre. The bags used in this province are usually made of ordinary jute and the same objection applies to them as to poor twine. Particles of vegetable matter off sacks cause serious trouble to manufacturers and wool packed in poor sacks will fetch a reduced price. The regular wool sack, generally about 40x90 inches in size and holding from 40 to 50 fleeces, should always be used. Sacks should open at the side, not at the end, for in packing wool in a jute sack open at the end the bottom fleeces brush along the sides as they drop in, gathering many loose fibres in their descent. In treading the wool down still more fibres become detached and the result is disastrous both to the producer and the manufacturer. In the wool warehouses sacks are almost always ripped open along the side so that there is no saving in having the opening at the end. *Jute sacks should not be used at all.* Nothing but the best quality of clean, close-woven, heavy hemp can be recommended, and, if possible,

paper lined sacks may be used. Ordinary sacks cost from 40c to 50c whilst paper lined sacks may be obtained at from 70c to 80c. Close woven canvas such as used in the packing of woollen goods makes first class wool sacks. In sewing up sacks the necessary requirements are; some strong glazed sewing twine, a large packing needle and several strong steel skewers. Sisal or rough jute twine should not be used in sewing sacks. Skewers are necessary to hold the edges together until they can be stitched, as, if pulled together by means of the twine, the canvas is apt to tear. The regular packing stitch which resembles a half hitch should be adopted. The fuller a sack is, as long as it can be well sewn, the safer it is and the easier to handle. Each sack should be numbered and the name or shipping initials of the consignee clearly marked on the outside together with the weight of each sack. A brush and a mixture of linseed oil, lamp-black and turpentine, or stencil, ink is necessary for this work. The marking should be done well away from the seams and never at the ends. Sacks containing buck or black fleeces should be marked accordingly.

STORING.

Sheep should always be thoroughly dry when shorn and the wool must be kept dry and should be stored in a clean, dry, well ventilated place. The bags should not come in contact with either floor or ground and in a damp climate should be piled alternately.

Wool should never be stored, unless in sacks, even for a limited time, as dust and dirt accumulate and the value deteriorates accordingly. In Europe, and especially in Great Britain, special care is taken to insure a thoroughly dust-proof sack, which will not shed fibres amongst its contents.

Wool stored according to the foregoing directions may be kept for a considerable time without serious deterioration or loss of weight. As wools age they are less likely to scour white.

MARKETING.

The custom of selling the wool crop to country storekeepers is to be deplored. The local men who buy in this manner think themselves compelled to pay the same price to one man as another, irrespective of the quality of the wool and the care that has been taken in grading and packing. This has tended to give the producer the idea that there is nothing to be gained by care, and also prevents him from acquiring a knowledge of market requirements. All kinds and grades of fleeces are sold in the same bag, resulting in a mixed and undesirable lot of wool. The commission merchant samples this and usually buys the whole consignment on the basis of the most inferior wool, with an added discount for mixed packing.

Wool should be sold either to some reliable commission firm or else direct to the manufacturer. Farmers having small shipments of wool should co-operate with one another to make a consignment. In this way they will obtain better prices and, in the case of a carload, reduced rates. The rates on wool shipments are as follows:

AVERAGE RATES PER 100 POUNDS OF WOOL FOR A CARLOAD.

In sacks, minimum weight 10,000 pounds, Regina to Toronto or Montreal.....	\$1.93
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In sacks, minimum weight 10,000 pounds, Regina to Minneapolis . .	\$1.36
In bales, compressed, minimum weight 20,000 pounds, Regina to Toronto or Montreal99
In bales, compressed, minimum weight 20,000 pounds, Regina to Minneapolis72
Not scoured, washed or combed, in bags, any quantity, Minne- apolis to Chicago50
In bales, compressed, any quantity, Minneapolis to Chicago40
Scoured, washed, combed or brushed, in bags, any quantity, Minneapolis to Chicago	1.20
In bales, compressed, any quantity, Minneapolis to Chicago90

MARKETING BASIS.

The producer in Western Canada sells his wool crop on a grease pound basis. The term grease pound means wool, dirt, oil, paint, etc., in fact, the fleece just as it comes from the sheep's back. The manufacturer buys on a clean or scoured wool basis. Clean wool is the pure wool after all foreign matter, oil, etc., has been clipped off or scoured out. The manufacturer sets his price by the estimated amount of clean wool he will receive. That is to say, in buying 100 pounds in the grease of a certain quality of wool, he estimates the shrinkage say at 65 per cent., thus out of his 100 pounds he will have 35 per cent. clean wool. That clean wool is worth 60c per pound or the 35 pounds is worth \$21, but he has had to buy 100 pounds in the grease to get it, so that 100 divided into \$21 gives a grease price of 21c per pound.

SHRINKAGE.

Shrinkage represents the foreign matter, scoured or otherwise removed from the wool in obtaining its clean contents. The intrinsic value of a lot of wool in the grease is determined by the weight of clean wool it will yield and the value of that clean wool for manufacturing purposes. The amount of shrinkage in a wool crop depends upon the character of the soil and pasture. Heavily grassed ranges more or less covered with snow in winter tend to lessen the amount of soil deposits in the wool, as compared with sparsely grassed areas constantly wind swept in winter, burdening the fleeces with more or less foreign matter. Rich nutritious grazing, even and uniform lines of breeding, the number of light, dry; or heavy, soggy fleeces in the clip, all affect the percentage of shrinkage, the actual test for which is scouring.

EXPERT OPINION ON WESTERN WOOL.

The following are extracts from letters received by the Department of Agriculture in answer to inquiries as to the deficiencies in western wool:

"Without the slightest doubt I say that the greatest trouble in the past with north-west wool has been in regard to *moisture* and so many of the clips are allowed to get wet that the purchasing of this wool is in most cases nothing more or less than a gamble. We have for several years past taken up large quantities of this material and every season have had the same complaint in either one clip or another, and last year it was exaggerated, almost every clip we had being more or less wet. I therefore state unequivocally that the *first step* which should be taken by the ranchers is to provide themselves with *absolutely water tight sheds*, first for shearing and then for storing the wool after it is shorn. At the same

time these sheds should be provided on *high and dry ground* and the wool should *not be stored on the ground itself but on a false floor raised at least sixteen inches from the ground*. After this all-important step has been attended to the rest is easy.

"Twine.—In this matter there has been in the past cause for great complaint as we have received fleeces tied with everything ranging from wire to half inch rope and have had instances where the weight of the rope used to tie fleeces has been as high as 8 per cent. of the weight of the fleece. You will, of course, understand that this is pretty expensive rope at fourteen cents a pound. I recommend, therefore, the sole use of *paper twine* as used by the best ranchers in Southern Alberta.

"Tags.—All tags, dung and short wool, clippings off the legs, etc., which fall away from the fleeces at shearing should be put on one side and packed separately. Under present conditions the shearers gather up all this refuse in their hands off the shearing boards, place it carefully in the middle of the fleece and roll it up there. This, in some countries, is actually a criminal offence, but in western Canada it is practically almost universally resorted to.

"Grading of Fleeces.—The question of breaking fleeces and putting these into matchings of an even quality is, in the writer's opinion, quite unreasonable in the west, but on the other hand it is a simple matter for the average rancher to make three grades of his wool without breaking the fleeces, *i.e.*, all his fine Merino fleeces should be packed together and marked 'fine.' Medium fleeces should be packed together and marked 'medium' and coarse fleeces should be packed together and marked 'coarse.' At present a bale is liable to contain all the qualities under the sun and it is impossible to buy judiciously as the *proportions* of the qualities are impossible to make out after the wool is sacked.

"As stated earlier there are a whole lot of other improvements which could be made but they are in the writer's opinion altogether unimportant as compared to the question of dry wool, tags and grading, and if the ranchers would devote their energies to these points and overlook the rest, more good could be done for Western wool than in any other way. Dry wool is the *great* necessity, as, when once the wool becomes wet, it is not only impossible to estimate its value as regards the percentage of water contained, but the staple immediately becomes seriously damaged and is liable to great deterioration."

"The only advice we can offer is to urge the farmers to use a proper cord or none at all for tying up the fleeces.

"To keep the sheep in good, healthy condition with proper protection winter and summer, particularly winter.

"When the wool is shorn to keep it dry and well protected from rain or dampness."

"The trouble with the average farmer is that he wants the longest price for everything, but he constantly forgets that quality, condition and intelligent handling of his product produces the quality that brings the high price."

SUMMARY.

General Rules for Handling of Wool Crop.

Care on Sheep's Back:

1. Breed for improvement and uniformity of fleece (not omitting block qualities.)

2. Never use hairy or coarse fleeced rams or ewes for breeding purposes.

3. Dip every animal thoroughly twice a year.

4. Never brand with ordinary paint, use a regular marking paint that *will scour out*.

5. Keep flock in thriving condition at all seasons.

6. Keep fleeces as free from straw, chaff, dirt, burrs, etc., as possible, winter and summer.

7. Keep sheep in dry quarters at all times.

Shearing Rules:

1. Never shear *wet or damp* sheep.

2. Use only a clean, dry, well lighted place for shearing.

3. Shear on platform or canvas.

4. Employ only experienced shearers.

5. Shear with a minimum amount of handling and at the same time be quiet, quick and avoid injury to animals.

6. Shear as smoothly as possible and, above all, avoid second cuts.

7. Keep fleece as clean and intact as possible.

Rolling and Tying:

1. Roll on lath table if possible, if not on *clean* space.

2. Before rolling clip off all "tags" (dirty, clotted wool).

3. To roll, turn sides in and roll from neck to rear leaving freshly cut side out.

In Tying:

4. Use only special twine, three ply paper twine if possible, if not a smooth hard twine which will not shed fibres.

5. Roll twine tightly around fleece at least once each way and knot securely with a square knot.

6. Never tie two fleeces together.

Grading and Packing:

1. Pack fleeces from ewes, wethers, bucks and blacks *separately*.

2. Pack fleeces from different breeds or grades of different breeds *separately*.

3. *Always pack "tags" separately.*

4. If different grades in one sack, separate with strong sheets of paper.

5. Use regular wool sacks of smooth, closely woven canvas, opening at side.

6. Sew up sacks with smooth, hard packing twine, using skewers and packing needle.

7. Address and number each sack clearly and mark total weight, number and kind of fleeces.

8. Mark sacks on side well away from seams. *Never at the ends.*

Storing:

1. Never store wool except in sacks, even if only for a short time.

2. Store in a dry, clean, well ventilated place. Wool must be kept dry.

3. Never let sacks rest on ground.

Marketing:

1. Sell to a reliable firm of commission agents or manufacturers.

2. Co-operate with neighbours to obtain reduced rates for larger shipments.